The American FERTILIZER

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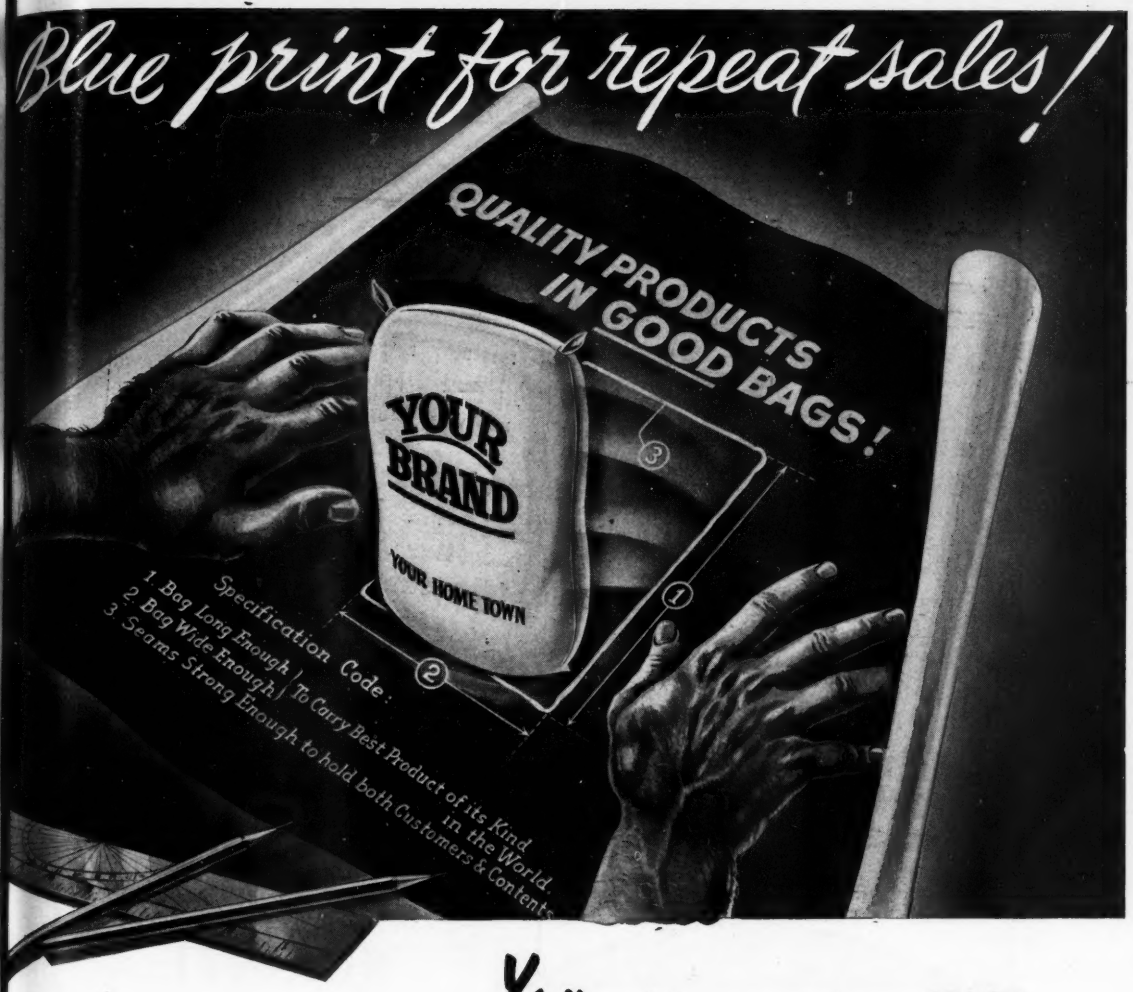

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...THE...

AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

Vol. 102 JUNE 30, 1945 No. 13

Phosphate Rock Industry of the United States in 1944

ANOTHER record for the annual marketed production of domestic phosphate rock was made in 1944, the quantity sold or used by producers reaching 5,376,643 long tons, according to reports by the producers to the Bureau of Mines, United States Department of the Interior—about one-quarter million tons above the figure reported for 1943, the previous record. All states, except Virginia, showed increases. The total value ($20,856,429) was nearly 2 million dollars greater than in 1943. Mined production was over 5 million tons in 1944. Figures for mined production and stocks for 1944 are not strictly comparable with those for 1943 because of the inclusion in 1943 of considerable quantities of Tennessee brown rock matrix in the reported figures. The P_2O_5 content of the domestic phosphate rock sold or used in 1944 was 1,739,489 tons.

Postwar Outlook

It is natural to expect that, after cessation of hostilities, prewar conditions in the phosphate-rock industry will return with the re-

SALIENT STATISTICS OF THE PHOSPHATE-ROCK INDUSTRY IN THE UNITED STATES, 1943–44

	1943 Long tons			1944 Long tons		
	Rock	P_2O_5 content	Value at mines	Rock	P_2O_5 content	Value at mines
Production (mined)	5,369,967	1,611,215	[1]	5,200,002	1,673,860	[1]
Sold or used by producers:						
Florida:						
Land pebble	3,483,194	1,179,314	$11,633,241	3,670,208	1,241,519	$13,136,472
Soft rock	71,171	14,739	254,995	60,087	12,526	259,523
Hard rock	34,128	12,208	201,241	22,500	8,056	138,952
Total Florida	3,588,493	1,206,261	12,089,477	3,752,795	1,262,101	13,534,947
Tennessee[2, 3]	1,309,059	375,502	5,822,249	1,324,849	381,621	5,975,337
Idaho	108,916	34,709	561,630	112,565	35,804	584,400
Montana	119,764	38,021	488,665	186,434	59,963	761,745
Total United States	5,126,232	1,654,493	18,962,021	5,376,643	1,739,489	20,856,429
Stocks in producers' hands, Dec. 31:						
Florida	1,110,000	371,000	[1]	815,000	273,000	[1]
Tennessee[2, 3, 4]	640,000	136,000	[1]	410,000	115,000	[1]
Western States	2,000	1,000	[1]	2,000	1,000	[1]
Total stocks	1,752,000	508,000	[1]	1,227,000	389,000	[1]

[1]Data not available. [2]Includes sintered matrix. [3]Virginia included with Tennessee. [4]Includes brown rock matrix of sinter grade, sintered brown rock, blue rock, and some matrix of washer grade.

opening of the old markets abroad and a more normal demand for phosphate rock in the United States. However, the world has been completely upset by the greatest war in history, and the organization of the postwar world has not yet been decided upon. Colossal war expenditures by the fighting countries forecast complicated financial difficulties, with possibly even greater economic instability than in the interval between World Wars I and II. The principal foreign markets for domestic phosphate rock were the Axis nations, whose future is not yet settled. Intense competition in all European markets is to be expected from the high-grade Russian phosphate deposits and from the rejuvenated phosphate producing industry of French North Africa. These sources are within easy shipping distance of European markets and may be favored by depreciated currencies. Some improvement from the war-depressed condition of our export trade in phosphate rock is to be expected, but domestic producers may obtain less of the foreign market than they held in the prewar years.

The present record domestic consumption is abnormal, as it is based upon an extraordinarily high war-stimulated farm income. Congress, however, has guaranteed the farmers 90 per cent of parity for their crops for 2 years, hence farm income may continue at a high level for some time, with concomitant large fertilizer purchases. With later declines from war-increased food demands and high agricultural prices, farm income may be expected to decline, followed by declines in fertilizer consumption and in the sales of phosphate rock for fertilizer manufacture. In the industrial and chemical field the greatly expanded facilities for production of phosphorus brought about by war demands will be excessive for peacetime needs unless new products and new processes are developed.

Production

Phosphate rock was mined in 1944 in Florida, Tennessee, Montana, and Idaho and apatite in Virginia. Increased production is reported from Florida and the Western States. The Tennessee figure and that for the total United States mined production are not strictly comparable with those for 1943, because of the inclusion of considerable quantities of washer-grade phosphatic matrix in some of the earlier reports from Tennessee. A more detailed classification called for in the schedules now used has made it possible to eliminate most of this material from the 1944 totals.

PHOSPHATE ROCK MINED IN THE UNITED STATES, 1940–44, BY STATES, IN LONG TONS

Year	Florida	Tennessee[1]	Western States	United States
1940	2,782,956	[2]1,120,551	164,570	4,068,077
1941	3,417,900	[2]1,301,067	203,216	4,922,183
1942	2,984,503	[2]1,568,162	266,273	4,818,938
1943	3,274,266	[2]1,868,407	227,294	5,369,967
1944	3,486,482	1,413,246	300,274	5,200,002

[1]Includes small quantity of apatite from Virginia.
[2]Includes some matrix of washer grade.

Sales

The quantity of domestic phosphate rock sold or used by producers reached a new high record in 1944 and exceeded the previous maximum of 1943 by 250,411 long tons. The total value in 1944 was nearly 2 million dollars above that of 1943. The average value per ton of the phosphate rock sold or used was nearly 5 per cent greater than in 1943.

PHOSPHATE ROCK SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1940–44

Year	Long tons	Value at mines	
		Total	Average
1940	4,002,700	$12,334,662	$3.08
1941	4,689,652	15,596,273	3.33
1942	4,644,240	16,597,492	3.57
1943	5,126,232	18,962,021	$3.70
1944	5,376,643	20,856,429	3.88

Distribution of Sales

The most popular grades of phosphate rock sold or used by producers in the United States in 1944, according to reports from them, were the 72-per cent B.P.L. grade and

PHOSPHATE ROCK SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1943–44, BY GRADES

Grades—B.P.L.[1] content (per cent):	1943 Long tons	1944 Long tons
Below 60	566,704	669,228
60 to 66	186,726	210,561
68 basis, 66 minimum	264,043	223,935
70 minimum	490,208	672,218
72 minimum	1,611,500	1,291,850
75 basis, 74 minimum	698,476	1,107,149
77 basis, 76 minimum	851,055	883,815
Above 85 (apatite)	$ 457,520	317,887
Undistributed[2]	$ 457,520	317,887
	5,126,232	5,376,643

[1]Bone phosphate of lime.
[2]Includes numerous grades of B.P.L. content from 65.9 to 85 per cent.

the 75/74-per cent B.P.L. grade. The quantity of phosphate rock containing less than 60 per cent B.P.L. sold or used contineed to increase and in 1944 formed 12 per cent of the total.

In 1944, the quantity of domestic phosphate rock sold or used by producers in the United States for the production of superphosphate is reported to have been slightly larger than in 1943. Increases were also registered in the quantity sold or used for the production of various chemicals and also for direct application to the soil. Less is reported to have been used in 1944 than in 1943 for fertilizer filler and for stock and poultry feed.

Prices

Maximum prices for Florida land pebble phosphate rock and Tennessee brown rock phosphate were originally established by the Office of Price Administration in October, 1942, (Maximum Price Regulation 240). Amendment 3 to this regulation, effective December 3, 1943, increased Tennessee Producers' prices 20 cents a ton. These regulations were operative during the first half of 1944. In Revised Maximum Price Regulation 240, effective July 6, 1944, the Office of Price Administration granted an average increase of 20 cents a ton in producers' maximum prices of Florida land pebble phosphate rock. With this increase there was announced a revision of the regulations covering Florida land pebble, Florida hard rock, and Tennessee brown phosphate rock, but no changes in prices other than that mentioned. Maximum prices were established for Florida hard rock phosphate.

CEILING PRICES PER LONG TON OF FLORIDA AND TENNESSEE UNGROUND PHOSPHATE ROCK, F.O.B. CARS AT MINES, BY GRADES, EFFECTIVE JULY 6, 1944

Grades–B.P.L. content (per cent)	Prices		
	Florida		Tennessee
	Land pebble	Hard rock	Brown rock
68/66	$2.20	...	$4.50
70/68	2.60	...	5.00
72/70	3.20	$7.10	5.50
75/74	4.20	7.85	...
77/76	5.20	8.60	...

On February 13, 1945, a price increase of 10 cents a ton, at the miners' level, for Tennessee phosphate rock was announced by the Office of Price Administration, to be effective February 17, 1945. (Amendment I to Revised Maximum Price regulation 240—Phosphate Rock.) This action is to make no change in retail prices, purchasers absorbing the increase. This addition to the prices is the estimated cost of an increase in wages given by the Fourth Regional War Labor Board with the approval of the Director of Economic Stabilization to four companies engaged in mining and processing Tennessee phosphate rock.

Review by States

Florida

New records were set in 1944 for the quantities of land pebble and total Florida phosphate rock sold or used. However, the quantities of both hard rock and soft rock marketed in 1944 were considerably less than in 1943. The total quantity of phosphate rock sold or used by producers in Florida was 164,302 long tons more than the former record of 1943. The total value of the rock sold or used in 1944 was greater than in 1943 but was still below the 1920 record value. The average values per ton for all types were higher than in 1943.

There were no hard rock phosphate mining operations on Florida in 1944. The Dunnellon Phosphate Mining Co. (P. O. Box 157, Savannah, Ga.), a former producer, reports that it made no output and no shipments in 1944 from its mine in Citrus County, near Hernando, that its plant was dismantled at the outbreak of the war in Europe in 1943, and that it will remain inactive for the duration of the war. J. Buttgenbach and Co. (Box 67, Lakeland, Fla.) and C. and J. Camp, Inc., (Box 608, Ocala, Fla.) operating jointly, dried some hard rock from stock at Fernandina, Fla., and exported a considerable quantity. These two companies were preparing a new mine—the Section No. 12 mine, near Hernando,—for operation, but made no production in 1944.

The Federal Trade Commission during the year ordered an investigation of the Florida Hard Rock Phosphate Export Association of Savannah, Ga., and the Phosphate Export Association, New York, N. Y., under the Webb-Pomerene Law (Export Trade Act) to determine whether they have entered into agreements and engaged in restraint-of-trade activities in violation of law.

In the land pebble field, the Pembroke Chemical Corporation (Pembroke, Fla.) did not mine or ship during 1944. The seven other companies usually operating in this field—American Cyanamid Co. (Brewster); American Agricultural Chemical Co. (Pierce); Coronet Phosphate Co. (Plant City); International Minerals and Chemical Corp. (Mul-

berry); Phosphate Mining Co. (Nichols); Southern Phosphate Corporation (Ridgewood), and the Swift and Co. Fertilizer Works (Agricola)—mined and shipped land pebble. The Coronet Phosphate Co. is defluorinating phosphate rock and apatite at West Conshohocken, Pa.

A new Bucyrus-Erie walking dragline excavator, reportedly the largest phosphate dragline ever built, was purchased in 1944 by the International Minerals and Chemical Corporation, and it is to be installed at its Peace River mine in 1945. This dragline is projected to have a boom of 215 feet with a 20-cubic yard bucket.

Tennessee

According to reports from producing companies, the tonnage of phosphate rock sold or used by Tennessee producers in 1944 (plus a small quantity of apatite from Virginia) was slightly greater than in 1943. The phosphate rock sold or used—all brown rock, except the Virginia apatite and a little blue rock withdrawn from its stocks and used by the Tennessee Valley Authority—was about 15,000 tons greater than in 1943. The total value was likewise greater.

Tennessee brown rock phosphate was mined in 1944 by the Tennessee Valley Authority (Columbia, Tenn.) and by several private companies: Armour Fertilizer Works (Room 350, Hurt Building, Atlanta, Ga.), Federal Chemical Co. (634 Starks Building, Louisville, Ky.), Harsh Phosphate Co. (Route 4, Murfreesboro Road, Nashville, Tenn.), Hoover and Mason Phosphate Co. (8 South Michigan Ave., Chicago, Ill.), International Minerals and Chemical Corporation (20 North Wacker Drive, Chicago, Ill.), Monsanto Chemical Co., (1700 South Second Street, St. Louis, Mo.), and Virginia-Carolina Chemical Corporation (Richmond, Va.)

According to the annual report of the Tennessee Valley Authority for the fiscal year ended June 30, 1944, a total of 319,000 tons of phosphatic raw materials was received at Muscle Shoals from Tennessee during the year, more than half of which came from the TVA Columbia (Tennessee) field phosphate plants. These plants recovered nearly 203,000 tons of phosphate sands, of which 165,500 tons were shipped to the furnaces at Muscle Shoals, where the nodulizing kilns produced 189,000 tons of nodules for the furnaces—an increase of 15 per cent over the previous fiscal year. No additional phosphate lands were acquired during the fiscal year, but options were taken on three tracts in Williamson County containing an estimated 1,309,000 tons of phosphatic matrix.

The output of elemental phosphorus increased 29 per cent from 18,900 tons in the fiscal year 1943 to 24,438 tons in 1944, and shipments for direct military use increased from 12,350 tons to more than 19,000. Installation was begun of a new and slightly larger furnace to produce phosphorus to replace the last unit which produced phosphoric acid, so that the total output of the plant could beused for military phosphorus.

Over-all production of concentrated superphosphate and calcium metaphosphate decreased markedly from that of the previous

(*Continued on Page 28*)

FLORIDA PHOSPHATE ROCK SOLD OR USED BY PRODUCERS, 1940–44, BY KINDS

Year	Hard rock			Soft rock[1]		
	Long tons	Value at mines		Long tons	Value at mines	
		Total	Average		Total	Average
1940	22,367	$100,353	$4.49	41,845	$102,508	$2.45
1941	38,116	211,049	5.54	47,750	132,472	2.77
1942	70,014	396,527	5.66	48,470	155,345	3.20
1943	34,128	201,241	5.90	71,171	254,995	3.58
1944	22,500	138,952	6.18	60,087	259,523	4.32

Year	Land pebble			Total		
	Long tons	Value at mines		Long tons	Value at mines	
		Total	Average		Total	Average
1940	[2]2,780,800	[2]$ 7,538,316	$2.71	[2]2,845,012	[2]$ 7,741,177	$2.72
1941	3,279,706	9,890,510	3.02	3,365,572	10,234,031	3.04
1942	2,893,756	8,826,705	3.05	3,012,240	9,378,577	3.11
1943	3,483,194	11,633,241	3.34	3,588,493	12,089,477	3.37
1944	3,670,208	13,136,472	3.58	3,752,795	13,534,947	3.61

[1]Includes material from waste-pond operations.
[2]Includes sintered matrix.

Farmer Cooperative Committee Opposes Government Fertilizer Production

At a recent meeting in Washington, the Special Fertilizer Committee of the National Council of Farmer Cooperatives recommended to the Council's Executive Committee that it go on record as opposing any further expansion of production and distribution of fertilizers by the Government in competition with private industry. This report of the Special Committee will be reviewed by the Executive Committee at its meeting in August and, if it receives the latter's unanimous approval, it will become the policy of the Council.

According to T. E. Milliman, of Cooperative G. L. F. Soil Building Service, who is a member of the Special Committee, full confidence was expressed that the private fertilizer industry, including farmer-owned-and-controlled cooperatives, will be able to meet all of this country's foreseeable fertilizer demands and at prices equitable to farmers.

It is also understood that the Committee referred to the favorable relationship, past and present, between fertilizer prices and the prices of other things farmers buy as well as the prices of commodities farmers sell; and pointed out that despite acute labor shortage and without appreciable plant expansion the industry increased production one-third during the war period, and expressed the belief that facility shortages in the Midwest and on the West Coast will be corrected upon the return of more normal conditions and when private industry, including farmer-owned-and-controlled cooperatives, is given an opportunity to provide the needed expansion without the dangers inherent in government competition.

The recommendations of the Special Fertilizer Committee may be summarized briefly as follows:

That all commercial production and distribution of fertilizer and fertilizer materials be done by private industry, including farmer - owned - and - controlled cooperatives, government production and distribution being limited to that necessary for research and demonstration, including pilot plant operation.

That potash and phosphate resources be explored with Federal Government encouragement and assistance.

That fertilizer materials be admitted into this country duty-free.

That fertilizer use be increased by promoting economic conditions favorable to an equitable farm income and by intensified research and educational work supervised and controlled by State agricultural colleges and experiment stations.

That State fertilizer control officials through joint action limit the number of grades of fertilizer as a means of promoting plant efficiency and reducing fertilizer costs to farmers by eliminating unjustifiably low grades and multiplicity of grades.

That Federal antitrust laws be vigorously enforced to prevent any illegal monopolistic practices in the fertilizer industry.

Some Quick Soil Tests Subject to Serious Error

A critical examination of the so-called "quick soil tests" as commonly employed shows they are subject to serious analytical error, according to the *Fifty-sixth Annual Report* of Cornell University Agricultural Experiment Station.

This is, perhaps, one of the main reasons for the poor correlations frequently observed between the results of quick soil tests and crop responses to fertilizers. Among some of the inherent chemical difficulties, interferences by adverse ions were found to cause sufficiently serious errors to invalidate the results in many instances, the *Report* states.

These interferences have been thoroughly investigated and obviated by the development of more specific reagents and by the use of competitive or differential complexion formers. As a result, accurate and chemically reliable quick soil tests suitable for practical routine soil testing have been developed for the following constituents: calcium, magnesium, potassium, manganese, iron, aluminum, phosphorus, nitrate nitrogen and ammonium nitrogen.

"These improved soil tests," the *Report* states, "have been shown to give consistently reliable results, which agree reasonably well with those obtained by the longer and more tedious standard chemical methods. The practical value of the various tests in determining fertilizer needs of the soils has not yet been established. Their widespread application and use for purposes of making fertilizer recommendations must necessarily await correlation of results of the tests and responses of crops to fertilizers on many different soils."

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Principal Articles in This Issue

New Secretary of Agriculture

President Harry Truman has appointed Congressman Clinton B. Anderson of New Mexico to become Secretary of Agriculture on July 1st. Mr. Anderson has become widely known as head of a Congressional Committee to investigate political campaign expenditures, but his ability to organize and simplify government procedures is doubtless his chief qualification for the job of untangling the rather complicated wartime machinery set up to deal with the food problems.

Mr. Anderson, however, comes to the high office of Secretary of Agriculture with first-hand knowledge of farming. He owns and operates an 800-acre dairy farm in Bernalillo County, New Mexico, and owns the farm in South Dakota where he was born.

He also has a business man's viewpoint. He is an insurance executive, having organized the Mountain States Mutual Casualty Company and is its president, and he also operates a general insurance agency at Albuquerque, New Mexico.

Mr. Anderson is also one of those civic club enthusiasts and in 1932–33 was president of Rotary International. In fact, the new Secretary appears to be an all-round man with broad experience, broad outlook, and with capacity to serve agriculture well.

Those who understand the Washington side of agriculture expect to see consolidations, simplifications, centralization of authority and responsibilities, fewer empolyees engaged in administering the various agencies dealing with agricultural production and with the distribution of farm crops.

Private industry serving farmers certainly does not look forward, as a result of the new regime, to anything else than a sound procedure in postwar agricultural readjustments.

No Change in Prices on Trona Potash

The American Potash and Chemical Corporation has announced that the 1945–1946 price schedule on muriate of potash produced at their Trona, Calif., plant will be the same as has prevailed during the past year. The basic price is 53½ cents per unit K_2O, in bulk, ex-vessel at the principal Continental U. S. ports. The usual seasonal discounts for regular monthly deliveries will be continued.

American Plant Food Council Elects Temporary Officers

A meeting of the incorporators of the newly organized American Plant Food Council was held at Washington on June 20th to elect officers and directors who will serve until a meeting of the entire membership can be called. Ralph B. Douglass, vice-president of Smith-Douglass Company, Norfolk, was elected president of the council, and George E. Petitt, vice-president of Potash Co. of America, was elected secretary and treasurer.

Directors were elected as follows:

Horace M. Albright, New Rochelle, N. Y., vice-president and general manager of the United States Potash Company; C. F. Burroughs, Norfolk, president of the F. S. Royster Guano Company; J. Albert Woods, Pelham, N. Y., president of the Chilean Nitrate Sales Corporation; A. Lynn Ivey, of Richmond, president of the Virginia-Carolina Chemical Corporation; J. E. Sanford, Atlanta, president of Armour Fertilizer Works; Oscar F. Smith, Norfolk, president of the Smith-Douglass Company, and Mr. Petitt.

It is planned to hold a meeting of the entire membership on a convenient date in July, at which time a permanent group of officers will be selected. It is the intention of the Council to have a paid president, and a committee consisting of Mr. Woods, Mr. Albright and W. T. Wright, of F. S. Royster Guano Co., Norfolk, was appointed to consider the field and report to the membership at the July meeting.

Wartime Limitations on Fertilizer Use Relaxed

Wartime limits on farmer's application of fertilizer have been relaxed through amendment of War Food Order 5, effective July 1, 1945. Dealers and manufacturers no longer will be required to obtain the special application forms before making delivery.

WFA officials pointed out, however, that limits on the use of edible oilseed meal in fertilizer will be retained in WFO 105, which is being slightly amended in wording.

The amended WFO 5 retains those provisions which prescribe "approved grades" of mixed fertilizer and which direct manufacturers, dealers and agents to distribute in their customary area and to make available a specified percentage of their fertilizer materials for home mixing.

Although a few grades of fertilizer are approved for Victory garden and specialty use only, the amended order permits the use of any approved grade for Victory gardens. Formerly, the order designated certain grades as the only ones permitted for Victory gardens and required special packaging and labeling for those grades.

Eastern States Farmers' Exchange Buys York Fertilizer Plant

The Eastern States Farmers' Exchange has purchased, effective June 15th, the land, buildings, and inventories of the York Chemical Works, owned and operated for many years by the Dempwolf family. It is planned to continue operation of the plant with the same production staff, under Owen H. Shaffer, which has operated the plant in the past. For the time being the output of the plant will continue to be available first to those customers of York Chemical Works who, under wartime regulations, have considered that company their "fertilizer home." Eastern States has two other plants, one at North Cambridge, Mass., and one at Wilmington, Del.

Personnel Changes by Federal Chemical Company

President C. T. Brown, of the Federal Chemical Company, Louisville, Ky., has announced that J. R. Sargent, formerly Division Sales Manager at Nashville, Tenn., has been promoted to General Sales Manager, located at the main office in Louisville. R. C. Braden succeeds Mr. Sargent as Division Sales Manager at Nashville and J. L. Stallings, formerly at Cullman, Ala., becomes Assistant Sales Manager at Nashville.

Hinkle Joins Central Chemical Staff

The Central Chemical Corporation has announced that Horace Hinkle, of Lancaster, Pa., will become associated with that company on July 1st, as a Director, and will be their Special Representative for Eastern Pennsylvania.

Los Angeles Chamber of Commerce Opposes National Fertilizer Bill

Taking the stand that the national fertilizer policy bill, Senate 882, would go too far in nationalizing the fertilizer resources of the nation and the manufacture of fertilizer materials, the Los Angeles Chamber of Commerce board of directors, according to announcement by Le Roy M. Edwards, president, has adopted a resolution opposing the measure.

Edwards said this resolution will be forwarded by way of the chamber's office in Washington, D. C., to members of Congress, governmental bureaus and other federal heads having to do with the bill.

The chamber board acted on a resolution proposed by its agricultural committee, headed by George B. Hodgkin. This resolution said:

"The most efficient and economical production will come from private development and operations. The present fertilizer plant capacity never has been fully utilized and the wartime expansion will increase excess capacity.

"Mandatory provisions of this proposed legislation and the natural procedures inherent in a nationwide program of this character would result in expensive, impractical and unnecessary research and demonstration work, as compared to that which is now being done by experiment stations and extension services of the various states."

It was pointed out the bill would provide for approximately 11,000 demonstration farms in Georgia, where the difference in crops grown and the conditions under which they are raised are few, as compared to a state like California, where there would be only some 4,350 demonstration farms.

"Provision for establishment of farmer cooperatives is unsound," the resolution charged. "Experience has demonstrated in practically all cases, cooperatives set up by outside agencies, rather than at the instance of the growers, soon fail.

"The organization of a large number of cooperatives under this act would be a tremendous undertaking, likely to result in a great number of failures with consequent losses to farmers and danger to the cooperatives' cause, as well as to soil conservation cause."

Hodgkin summed up his report to the chamber board by expressing belief that "this attempt to socialize the fertilizer resources and operations of the nation would be one more step toward a policy of nationalization of farm lands.

"Provisions of the bill are, in effect, similar in many respects to legislation already being proposed by some interests to set up a program which, under guise of soil conservation, would permit the government to enter into the production and sale of farm products."

Value in Fertilizing Pastures

The Agricultural News Service, University of Florida, says: "The value of fertilizers to pastures is well demonstrated on plots at the Experiment Station in Gainesville. There unfertilized carpet produced an average of 72 pounds of beef per acre during the grazing season, fertilized carpet produced 141 pounds of beef per acre, fertilized carpet and lespedeza returned 250 pounds of beef per acre, and fertilized carpet grass and clovers produced 752 pounds of beef per acre.

"The carpet grass was fertilized with 500 pounds of a 6–6–6 per acre, and the clover, which was already established and had been limed, received 400 pounds of an 0–10–10."

North Carolina Agricultural Extension Service news release, quoting W. W. Woodhouse, agronomist, says: "In discussing plant food requirements of permanent pastures Mr. Woodhouse said that lime was not the only material needed. Phosphate is almost always needed and potash is usually beneficial. Too often the value of liming is lost because the other necessary plant foods are not supplied.

"Take this record for example: 1,253 pounds' yield on the untreated plot; phosphate alone, 1,229; lime alone, 1,511 pounds; lime and phosphate, 2,794 pounds."

Plant Preferences for Foods

When the individual ions were applied to the soil at the same rates, the percentage intake by plants was greater for magnesium, sodium and potassium than for calcium. Chlorine, bromine and iodine intake were higher than the intake of phosphorus.

This information is presented in the Massachusetts Agricultural Experiment Station's *Annual Report.* It is added that lettuce did not increase its content of calcium, magnesium, sodium, and potassium as much as did those in the lower evolutionary scale—celery, beets, cabbage, and beans.

Report of Fertilizer Tests in Georgia

Results of studies made of fertilizers given in the 56th Annual Report of the Georgia Agricultural Experiment Station for the fiscal year of 1943–44, just issued, are summarized as follows:

Fertilizer for Cotton Following Lespedeza Sericea

In 1943, the fifth year after the sericea had been plowed up, the average increase per acre from sericea on all plots was 200 pounds of seed cotton per acre. The results are in marked contrast with those obtained from annual legumes, where little or no increases are obtained the second year.

In 1943, five years after the sericea had been plowed up, the plots receiving phosphate or phosphate and potash still showed an increase of 220 and 245 pounds of seed cotton from the sericea. There was no significant increase on the plots receiving no fertilizer and the increase on the plots receiving nitrogen was small.

Sulphur in Cotton Fertilizer

Cotton fertilizers have usually contained sulphur either in the form of gypsum in superphosphate or in sulphate of ammonia. With the development of new fertilizer materials, it is possible to mix fertilizers that do not contain sulphur. Numerous experiments by this Station have shown that sulphur is needed for cotton in Georgia.

Results obtained at Brooks in 1943 showed an average increase from phosphorus (48 lb. P_2C_5) was 112 pounds of seed cotton, while gypsum increased yields 197 pounds. Where 50 pounds of gypsum per acre were used the yield was increased from 869 pounds to 1,080 pounds of seed cotton per acre. Where equivalent amounts of ammonium nitrate and sulphate of ammonia were applied, the yields were 885 pounds and 1,011 pounds, respectively. Two weeks after the top-dressing of gypsum, sulphate of ammonia, sodium sulphate or sulphur, the yellow, chlorotic leaves turned to a normal green.

Effects of Potash and Borax on the Yield of Alfalfa

An alfalfa fertilizer test at Pantherville, Georgia, yielded 4,161 pounds of air dried hay per acre on plots where 100 pounds K_2O and 20 pounds borax were applied and only 2,532 pounds of hay where no borax or potash were used. No significant increase was obtained for borax without potash or potash without borax.

One hundred pounds of K_2O per acre increased the yield of hay from 772 pounds to 1,334 pounds (first cutting). The addition of 20 pounds of borax further increased the hay yield to 1,900 pounds. The average stand on the no-potash, no-borax plots was 67 per cent while the stand receiving the highest rates of potash and borax was 95 per cent.

Ammonium Nitrate Test

In a test with ammonium nitrate compared with nitrate of soda as a side-dressing for corn, the former yielded 21.6 bushels corn per acre as compared with 21.8 bushels per acre for nitrate of soda. Plots receiving no nitrogen fertilizer yielded only 13.8 bushels per acre.

Sources of Phosphate for Corn, Peanuts, Soybeans

In this test conducted on Cecil sandy loam at Experiment, both 16 per cent superphosphate and Calphos were used, with no phosphatic check. Results are given in the following table:

SOURCES OF PHOSPHATE FOR COTTON, CORN, PEANUTS, AND SOYBEANS

Treatment Per Acre*	Yield Per Acre				
	Seed Cotton pounds	Corn pounds	Peanuts pounds	Soy-beans pounds	Soy-bean Hay pounds
No P_2O_5.....	493	616	508	216	778
24 lbs. P_2O_5 (16% Super)	793	880	393	210	899
24 lbs. P_2O_5 (Calphos)...	560	544	397	222	845

*Plots received 32 pounds K_2O. Corn and cotton received 32 pounds N. Soybeans and peanuts received 16 pounds N.

From the above data, 16 per cent superphosphate appeared to be a better source of phosphate than Calphos for cotton, corn and soybean hay. Either of the two kinds appeared to decrease the yield of peanuts.

Effect of Fertilizers in Schlerotium rolfsii on Spanish Peanuts

On a fertilizer at Arabi, Schlerotium rolfsii was found attacking Spanish peanuts two weeks before harvest time, destroying roots and nuts.

Nitrogen in every case on the Spanish peanut reduced the amount of the disease,

(Continued on Page 26)

Fertilizers on Utah Soils

Pastures

"Experimental pastures at the Utah Station fertilized with treble superphosphate and manure produced practically 100 per cent more forage than did unfertilized areas left as checks," is a statement from the Utah Station *Biennial Report.*

Butterfat produced from the forage during the two-year period averaged approximately 200 pounds per acre from fertilized areas compared with 103 pounds from the unfertilized acres, the report adds.

"If the cost of phosphate is placed at $3.00 per hundred pounds, $2.00 per ton for manure, and butterfat at 70 cents per pound, there is a gross return of approximately $4 for each $1.00 spent for fertilizer.

"A chemical analysis of the forage harvested from the fertilized and unfertilized areas showed that the forage from the fertilized plots had a phosphorus content of 0.33 per cent compared to 0.24 per cent for that from the unfertilized areas, and a protein content of 17.3 and 15.9 per cent, respectively, for forage from fertilized and unfertilized plots," the Ltation reports.

Phosphorus Content

Results of fertilizer tests over a fourteen-year period show an increased phosphorus content of plants where phosphorus fertilizers or barnyard manures were used. Crops, the Station reports, showing increased phosphorus content were potatoes, beets, barley, wheat and alfalfa. The increase was greatest in alfalfa and least in barley. Adequate phosphorus in rations of dairy cows, the Station says, is required to prevent parturient hemoglobinemia. Researchers were able to induce a case of the disease by feeding a phosphorus-deficient ration. Bone meal administered in drenches quickly restored the blood phosphorus level.

By providing adequate amounts of this element in the ration, the Station says, the disease may be prevented.

Fruit Trees

Application of ammonium sulphate alone and in combination with treble superphosphate, the Utah Station says, has increased yields on experimental peach trees from 170 to 201 bushels per acre. Trees not fertilized produced an average of 308 bushels per acre compared with 478 bushels per acre for trees treated with three pounds each of ammonium sulphate and treble superphosphate. This represents an increase of 60 per cent due to fertilizers.

Sugar Beets

In fertilizer tests over a twelve-year period, yields of sugar beets were increased an average of 42 per cent by the addition of treble superphosphate, 72 per cent by the addition of manure, and 83 per cent by the addition of both manure and treble superphosphate.

New Bermuda Grass Responds Well to Fertilizers

Coastal Bermuda grass, a product of research breeding at the Georgia Coastal Plain Experiment Station, grows taller, has larger leaves, stems, rootstocks and runners than common Bermuda. Tests reported from South Carolina state that in clipping tests of the new Bermuda grass nearly twice as much grass as the common variety was obtained and was equally nutritious.

When fertilized with 500 pounds of 4–8–4 and 500 pounds of nitrate of soda, Coastal Bermuda produced four cuttings of 4 to 6 tons per acre.

FERTILIZER MATERIALS MARKET

NEW YORK

Box Car Shortage Is Felt in the Shipment of Various Fertilizer Materials. Advance Contracts Being Made on All Chemical Fertilizer Materials. No Improvement in Sight for Organic Ammoniates

Exclusive Correspondence to "The American Fertilizer"

Sulphate of Ammonia

Current shipments of sulphate of ammonia continue heavy. Production is following the trend of steel output and hence is somewhat lower than previously. There has been some difficulty with shipments due to the continued box car shortage.

Ammonium Nitrate

This material is closely tied up to ordnance requirements. About 7,000 tons were recently released for fertilizer use and were taken by the trade without delay. Fertilizer manufacturers are contracting for advance tonnage, subject to WPB allocations.

Nitrate of Soda

Nitrate of soda is moving steadily into agricultural channels in sufficient quantities to fill present requirements. Current prices have been continued throughout July.

Organic Ammoniates

The prospects for organic fertilizer materials are not bright. Smaller output by packing houses, coupled with labor troubles, have reduced the over-all supply of by-products. What material does reach the market is quickly taken by the feed trade at prices beyond the fertilizer range.

Superphosphate

Output of superphosphate is holding up fairly well in spite of continued labor shortage. Fertilizer mixers continue to contract for their 1945–1946 needs and a considerable portion of next season's tonnage is now under order.

Phosphate Rock

The continued output of superphosphate is reflected in the steady demand for phosphate rock. While there has been an improvement in ocean transportation to acidulators at Atlantic and Gulf ports, rail shipments are still handicapped by the box car shortage.

Potash

With the announcement of price schedules by the producing companies, which in every case have continued the current prices, fertilizer mixers have been prompt to place their orders for next season's business in order to take advantage of the maximum discounts. The prospects are that more muriate and less manure salts will be produced, while the outlook for more sulphate of potash is not bright at present.

CHARLESTON

Lack of Transportation Facilities Severely Handicaps Phosphate Rock Shipments. All Nitrogen Materials Scarce.

Exclusive Correspondence to "The American Fertilizer"

CHARLESTON, June 28, 1945.

The box car and hopper bottom car situation in the Florida field is quite serious and this is retarding the movement of phosphate rock to plants that are doing their best to furnish superphosphate for the coming season.

Organics.—The situation on this continues extremely tight, worse than the season just passed. Offerings of anything like bone meal, blood or tankage are practically unobtainable.

Sulphate of Ammonia.—Due to the fact that production is less than earlier in the year, owing to smaller steel production, it is extremely hard to get any offerings.

Nitrogen Solutions.—Some additional solutions were offered during June, the fertilizer industry being allowed only 400 cars.

Castor Pomace.—The situation on this has not improved and is so tight that no offerings are available for either prompt or future shipment.

How Much Fertilizer Makes A Pound

Victory gardeners who receive instructions as to the number of pounds to apply to a given area, like to know how many pints to apply. Dr. Charles E. Kellog, of the Division of Soils of the United States Department of Agriculture, has worked out a relationship of a pound to a pint (liquid measure).

Ground limestone, granular sodium nitrate and potassium sulphate weigh 21 ounces to the pint. Ammonium phosphate, double superphosphate, superphosphate, mixed fertilizers (garden grades) and muriate of potash run 15 ounces to the pint. Bone meal runs 13 ounces to the pint. Ammonium sulphate and granular ammonium nitrate weigh 11 ounces to the pint. Cottonseed meal, sulphur, and fish scrap rate 10 ounces to the pint. Hydrated lime is 8 ounces to the pint.

The United States Department of Agriculture has issued a leaflet for free distribution, entitled *How Much Fertilizer Shall I Use?*, for the convenience of gardeners.

Fertilizing Wheat in Oklahoma

Fertilizers can be used effectively not only to increase yields but to improve the quality of wheat in Oklahoma, according to a recent well-prepared bulletin issued by the Oklahoma Agricultural Experiment Station. The bulletin, *No. 285*, is entitled "Fertilizing Wheat for Yield and Quality," and is written by H. F. Murphy, head of the Department of Agronomy.

Studies were made of the effect of fertilizers on yield and growth, maturity, straw, grain, quality, effect on flour, baking quality and protein content as affected by time of applying nitrogen.

The conclusions as given in the bulletin are reproduced herewith:

The percentage of protein in both grain and flour was reduced by phosphorus fertilization and increased by nitrogen fertilization. Potash fertilizer had little effect.

All fertilizers containing phosphorus gave higher grain yields than other combinations. However, a mixture of three-fourths superphosphate and one-jourth nitrate of soda gave higher yields than superphosphate alone. This mixture was the best fertilizer combination tested, considering both yield and protein. Wheat from this plot also made a very nice loaf of bread having slightly greater volume than test loaves from unfertilized wheat.

Phosphate fertilization gave much greater fall growth, and phosphated plots would have furnished considerably more fall pasture.

Color and texture scores of bread were only slightly affected by the different fertilizer treatments.

The residual effect of superphosphate has been pronounced in keeping up yields, although high rates of application of this fertilizer with limited or no nitrogen have shown definite nitrogen deficiency in the wheat plant. The residual effects of nitrogen and potash have been much smaller.

Dry foot rot was less severe in 1943 on plots adequately supplied with phosphate.

Wheat treated with nitrate of soda milled a flour slightly higher in protein than that from plots treated with ammonium sulphate.

In a comparison of fall and spring applications of nitrogen, there was little difference in the protein content of the flours.

Among different times of spring application of nitrogen, protein content was most greatly influenced by available suuly of nitrogeu at the approximate boot stage of plant growth.

CHICAGO

Practically No Fertilizer Organics in the Market. Feed Materials Demand Heavier than Current Supply.

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, June 27, 1945.

Inquiry for organics continues coming into the market, but offerings are practically non-existent. How long this condition will last is a matter of concern to the entire trade.

Extremely light production and strong demand are prevailing conditions in the feed market. Ceilings are therefore easily maintained.

Ceiling prices are:

High grade ground fertilizer tankage, $3.85 to $4.00 ($4.68 to $4.86 per unit N) and 10 cents; standard grades crushed feeding tankage, $5.53 per unit ammonia ($6.72 per unit N); blood, $5.53 ($6.72 per unit N); dry rendered tankage, $1.25 per unit of protein, f. o. b. producing points.

CLASSIFIED ADVERTISEMENTS

Advertisements for sale of plants, machinery, etc. and for help ond employment, in this column, same type as now used, 60c per line, each insertion.

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Charles J. Brand Author of Book on Economic Systems

Dr. Charles J. Brand, former executive secretary and treasurer of the National Fertilizer Association and now an economic consultant at 1111 Investment Euilding, Washington, D. C., has recently written and published a book entitled *What Economic System for America?* The book is a timely and fair discussion of economic systems operating in recent years throughout the world, in which the reader is given a clear conception of their fundamental differences. Capitalism, economic cooperation, communism, fascism, and national socialism are defined.

A chapter tells why the coercive systems are not suited to the United States. World resources and populations as factors in developing economic systems are weighed. Contemporary conditions in America, evidences of economic and social well-being in America, and fundamental objectives are discussed, leading up to the question, "Which Economic System Is Best for America?"

The book will be valuable to business men whose "way-of-life" is being assailed and who need to know more about how to defend themselves.

Down to Earth

Down to Earth is a new publication issued by the Dow Chemical Company, edited by Eugene Perrin. It is announced that 13,000 copies are distributed to those engaged in agricultural research in the United States and Canada.

Farm cash income was smaller in 1944 than in 1943 in 14 States, but the only region to show decline as a whole was the West North Central region.

Arkansas Fertilizer Tests

Pasture Fertilization

Good pastures can be established on upland soils of low productivity, the *Annual Report* of the Arkansas Agricultural Experiment Station points out. Heavy grazing of a 10-acre pasture, which had not been fertilized, produced an average gain in weight of 213 pounds per acre in brief animals. Applying 100 pounds of concentrated superphosphate resulted on an average gain of 312 pounds per acre over the same 6-month period.

Top-Dressing Small Grain

Top-dressing of small grain with 20 pounds of ammonium nitrate, the report states, increased yields 11.3 bushels of oats per acre over the unfertilized at the Levistock Station and Forestry Branch Experiment Station; 11.7 bushels increase per acre at the Cotton Branch Experiment Station; and 15.8 bushels increase at the Rice Branch Experiment Station.

Applications of 40 pounds of nitrogen per acre gave an increase of 19.2 bushels per acre at the Cotton Branch Station and 22.7 bushels increase at the Rice Station.

Applications of 60 pounds of nitrogen gave 20.9 and 31.2 bushels increase at the same locations.

With a 20-pound application of nitrogen-yield of barley was increased 18.5 and 23.5 bushels at the Levistock and Forestry Branch Experiment Stations. At the main Station the yield was 21.9 bushels of barley compared to 19.9 unfertilized. Larger applications of nitrogen at the main Station did not result in larger increases. The same was true of rye and wheat.

Fertilizers Increase Graas Nutrients

Using guinea pigs to test the influence of fertilizers on nutrients in rescue grass, the Arkansas Experiment Station reports that fertilizers used were nitrogen alone; nitrogen and phosphorus; nitrogen, phosphorus and potash; these three elements with copper, boron, iodine and zinc combined. One treatment contained the primary elements without lime.

All fertilizers increased yields of grass. Substantially greater returns were obtained where nutrient yield (acre yield plus nutrient ratio) was used instead of hay yield.

The greatest net return per acre was obtained with the treatment including double nitrogen, phosphorus and potassium (no lime) which resulted in $10 profit per acre. Potassium, the report states, reduced net profit, and no increase in profit was obtained by doubling the basic rate of phosphorus. A substantial increase in profit resulted from doubling the basic rate of nitrogen.

Cows Definitely Preferred Phosphated Pastures

"Five cows, which grazed a total of 277 hours with equal access to fertilized and unfertilized plots, spent 167 of these hours on the fertilized plots," states the Oklahoma Agricultural Experiment Station. The fertilized plots were treated with 150 pounds of superphosphate per acre. The preference for fertilized plots, the Station says, applied to all crops.

Fifty-Five Years' Test With Fertilizers

Fifty-five years ago, the Massachusetts Agricultural Experiment Station started a test of the effects on the soil of a long-time fertilizer program.

Recent results, the Station's *Annual Report* states, with hay as an indicator crop, showed that the fertility level of all the plots was much higher on the limed than on the unlimed portions. The unlimed part of the unfertilized portions showed crop failure and indication of nutrient deficiencies.

On the complete fertilizer plot (NPK), the limed area yielded about 200 per cent more hay than the unlimed area. On the limed areas, the complete-fertilizer plot yielded about 50 per cent more than the no-fertilizer plots. On the unlimed area, the plots receiving nitrogen, nitrogen plus phosphorus, and nitrogen plus potash, showed an increase of about 350 per cent in yield of hay over the no-fertilizer plots.

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Symptoms of Phosphorus and Nitrogen Shortage on Sugar Beets

Sugar beets require a considerable amount of readily available phosphorus and nitrogen for their full development, the Montana Agricultural Experiment Station declared in its *Annual Report.*

Symptoms of phosphorus and nitrogen deficiencies are discussed in the report as follows:

"A slight deficiency of available phosphate may not produce symptoms in sugar beets that are readily recognized, although the beet roots are small, the tonnage low, and the tops remain green up to harvest. Under such conditions the ration of tops to roots is higher than where there is sufficient phosphate. In case of a severe phosphate deficiency in the soil, necrotic spots will appear either on the edges of the sugar beet leaves or between the veins in July or later. These spots enlarge and their color changes from light to dark brown and finally to black. In severe cases many spots coalesce and finally the whole leaf blade begins to have the appearance of being burned and the leaves assume the form of a crescent with upward curling and with the tissue of the leaf practically black and dry like parchment. This blackening of the leaves gradually progresses downward and all the petioles become black and dead. If all the leaves of a sugar beet plant are killed sometime before harvest, the root usually becomes soft and may decay due to infection with different rot-producing soil organisms.

"There are also many degrees of severity of nitrogen deficiency in sugar beets. A slight deficiency may cause a somewhat early yellowing of the tops, whereas a severe shortage will cause yellowing very early in the season. The result of a severe deficiency will be small yellow tops, low yield of roots and no significant response to a phosphate fertilizer. The top to root ratio may fall as low as 20 per cent for tops and 80 per cent for roots, whereas the optimum is about 35 to 40 per cent for tops and 60 to 65 per cent for roots at the time of harvest. Experiments show that a liberal application of manure, supplemented by nitrogenous fertilizers will correct nitrogen deficiency in beets. When a considerable amount of nitrogenous fertilizers is applied, phosphates also should be applied—otherwise the nutrition of beets will be unbalanced."

What Alfalfa Takes From and Can Give To the Soil

H. I. Snider, Assistant Chief, Soil Experiments, University of Illinois College of Agriculture, is quoted in an Extension Service News release as stating that a four-ton yield of alfalfa was found to contain an average of 220 pounds of nitrogen, 14.4 pounds of phosphorus, 100 pounds of potassium and approximately 500 pounds of limestone. As a legume crop, he states, alfalfa takes only about one-third of its nitrogen from the soil and two-thirds from the atmosphere.

At present prices of fertilizer the plant-food elements can be replaced at a cost of about $4.00 for each ton of alfalfa removed from the soil and adds that when a ton of alfalfa is sold, the nitrogen obtained from the air goes with no gain to the grower, but rather as a gain to the buyer. But when it is fed on the farm and the manure is returned to the land, there would be a large gain in nitrogen and the potassium and phosphorus loss would be greatly lessened.

Grass-Legume Hay Fertilizers

When potash was reduced from 100 to 50 pounds per acre in a complete fertilizer used on grass-legume hay, there were very few legume plants present and the total yield was greatly reduced, states the Rhode Island Agricultural Experiment Station. When potash was reduced to 25 pounds per acre, no legumes were present in the stand.

The Station's Annual Report concludes: "This gives additional evidence to prove that certain Rhode Island soils lack sufficient potash for the growth of legumes and that fertilizers to be applied to grass-legume hay mixtures must contain potash to insure good crops."

See Page 4

Potato Stem-End Browning and Fertilizers

To find if there was any relation between the disease of stem-end browning of potatoes and fertilizers, the Maine Agricultural Experiment Station says, in its Annual Report, that approximately 100 barrels of potatoes, taken from plots receiving different grades and quantities of fertilizers, were examined. The data indicated that the incidence to stem-end browning tends to increase with the amount of fertilizers used.

On four plots nitrogen was varied from 0 to 6 per cent while phosphoric acid and potash were kept constant at 8 per cent. Tuber samples from these plots developed progressively more stem-end browning as the amount of nitrogen in the fertilizer was increased.

Tuber samples taken from plots having varying amounts of phosphoric acid showed no definite trend in relation to tubers showing stem-end rot.

In the potash series the percentage of tubers developing stem-end browning was definitely correlated with the amount of potash used in fertilizer. The 4–8–0 fertilizer produced tubers entirely free of stem-end browning.

Plots which had received muriate of potash produced tubers with about twice as much stem-end browning as sulphate of potash.

Borax applied at the rate of 5, 15 and 25 pounds per acre indicated that the addition of borax to the potato fertilizer tends to reduce the amount of stem-end browning, but when used in greater amounts than 5 pounds to the acre it resulted in appreciable reduction in the yield of potatoes.

REPORT OF FERTILIZER TESTS IN GEARGIA

(*Continued from Page 15*)

and the combination of nitrogen and potash was almost disease-free. The combination of phosphorus and potash was by far the worst and the plots without fertilizer were second.

Fertilizing Peanuts

Comparisons were made for both Spanish and North Carolina Runner peanuts on different soil types, using 0–24–24, 12–24–24, 12–24–0, 12–0–24, 24–24–24. The highest yield at Arabi for Spanish was 719 pounds from 12–0–4; for N. C. Runner, 365 pounds from 24–24–24.

The highest yield at Perry was 1,117 pounds from 12–0–24 for Spanish, and 1,123 pounds for N. C. Runner from 12–24–0.

On a Tifton sandy loam at Arabi, fertilizer amendments of dolomite, gypsum, a mixture of dolomite and gypsum and calcic lime were made at the rate of 500 pounds per acre. The combination of dolomite and gypsum gave largest yields for both types of peanuts.

The same amendments tried at Perry revealed the highest yield from calcic limestone for Spanish peanuts, and dolomite gave the largest yields for N. C. Runner.

At Reynolds, the highest yield was with the combination of dolomite and gypsum for both varieties of peanuts.

Green Manure for Eroded Lands

Severely eroded land received six different treatments and was seeded to rye, rye grass and winter legumes. The yield of green manure per acre for each treatment is shown in the following table:

EFFECTS OF DIFFERENT TREATMENTS ON THE YIELD OF GREEN MANURE ON ERODED LAND

Treatment Per Acre	Yield of Green Manure Per Acre pounds
Lime, Manure, Nitrogen	9,801
Superphosphate, Manure, Nitrogen	11,556
Superphosphate, Lime, Nitrogen	10,406
Lime, Superphosphate, Manure, Nitrogen, Mulch	21,659
Lime, Superphosphate, Manure, Nitrogen	11,374
No Treatment	1,815

The mulched plot which in addition to lime, superphosphate, manure and nitrogen, received a thin layer of spoiled cowpea hay spread over the surface after seeding, produced approximately twice the amount of green manure as any other plot.

Prices based on first 66 months of both wars
Source: Bureau of Labor Statistics

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The silliest man (or woman) in America today is the one who thinks he's ahead of the game when he finds a way around the rules of rationing.

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A United States War message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by this magazine in cooperation with the Magazine Publishers of America.

PHOSPHATE ROCK INDUSTRY OF THE UNITED STATES IN 1944

(*Continued from Page 10*)

year, owing to increased demands for elemental phosphorus by the Chemical Warfare Service. Less than 48,000 tons of the triple superphosphate were produced compared with the fiscal year 1943 production of 60,000 tons. Production of calcium metaphosphate dropped from 7,300 to 2,900 tons. Shipments of triple superphosphate from the Muscle Shoals plant totaled about 51,900 tons and of calcium metaphosphate about 1,000 tons. TVA also produced about 9,000 tons of dicalcium phosphate, to help meet the shortage of phosphate for stock feed, in a plant placed in operation in October, 1943.

Late in the fiscal year TVA began construction of a large plant in the Tennessee phosphate field to produce by a fuel-fired furnace process, fused defluorinated tricalcium phosphate, a material containing about 29 per cent P_2O_5, and suitable for either fertilizer or stock feed use. In the fiscal year 1944 the pilot plant produced more than 1,000 tons of this product, of which 325 tons were further processed to a form suitable for animal-feed supplement.

There was a great increase in 1944 in the production and distribution of granulated calcium silicate slag from the electric furnaces. This slag is of value as a liming material and soil conditioner and in addition contains a small amount of phosphate plant food. Production was 220,000 tons in 1944, and about 243,000 tons were shipped for agricultural use. About 1,200 tons of by-product potash-phosphorus furnace dust were produced and 500 tons distributed for use in the test-demonstration programs. Production of by-product ferrophosphorus totaled 1,000 tons.

Virginia

In 1944 apatite was produced as usual from the Piney River nelsonite deposit. In the early part of the year this property was operated by the Virginia Chemical Corporation, a wholly-owned subsidiary of Interchemical Corporaion. Later, after several reported changes in ownership, the Calco Chemical Division of the American Cyanamid Co. acquired the property, which became a unit of that division.

A considerable quantity of apatite from this deposit was defluorinated by the Coronet Phosphate Co. (19 Rector St., New York 6, N. Y.) at the Valley Forge cement plant at West Conshohocken, Pa., for use as feed amendment.

TENNESSEE PHOSPHATE ROCK (INCLUDING SINTERED MATRIX) SOLD OR USED BY PRODUCERS, 1940–44
(*Includes apatite from Virginia*)

Year	Long tons	Value at mines	
		Total	Average
1940	994,361	$3,967,043	$3.99
1941	1,120,358	4,590,965	4.10
1942	1,366,335	6,127,792	4.48
1943[1]	1,309,059	5,822,249	$4.45
1944[1]	1,324,849	5,975,337	4.51

[1]Includes a small quantity of blue rock.

Western States

A new high record for phosphate-rock production in the Western States was set in 1944, the marketed production reaching 298,999 long tons (with a P_2O_5 content of 95,767 tons). The production in 1944 came from Idaho and Montana; Utah was inactive.

Idaho rock sold or used in 1944 (112,565 long tons with 35,804 tons P_2O_5 content) was still below the record production of 1942 (114,079 tons). The average P_2O_5 content was 31.80 per cent. The same two companies were active in this State in 1944 as in 1943 and 1942. By far the larger of these (the Anaconda Copper Mining Co.) operated its No. 3 mine at Conda, Caribou County. Most of the Conda shipments in 1944 went to Anaconda, Mont., for conversion to superphosphate. Much smaller quantities were used for the manufacture of phosphate chemicals, for direct application to the soil, for stock and poultry feed, and for fertilizer filler. Some was exported for acidulating. The other producer (the Teton Phosphate Co., Boise, Idaho) mines phosphate rock from its Bennington mine in Bear Lake County near Montpelier. This material was g ound in the company plant and sold for direct application to soil.

(*Continued on Page 30*)

Montana was the largest phosphate-rock producer of the Western States group in 1944 as in recent years, its lead in phosphate rock sold or used over Idaho increasing to 73,869 long tons. Its total marketed product in 1944 (186,434 tons with a P_2O_5 content of 59,963 tons) exceeded its record of 1942 (150,402 tons) by 24 per eent; the average

turing Corporation, Salt Lake City, Utah, which mined and shipped phosphate rock in 1942 from a Federal lease near Spanish Fork, Utah County, for use in pig-iron blast furnaces, made no production in 1943 or 1944.

Some interest was shown during the year in phosphate rock deposits near Cokeville and in the Wind River Mountains, Wyoming.

WESTERN STATES PHOSPHATE ROCK SOLD OR USED BY PRODUCERS, 1940–44

	Idaho			Montana		
		Value at mines			Value at mines	
Year	Long tons	Total	Average	Long tons	Total	Average
1940	99,088	$441,598	$4.46	64,239	$184,844	$2.88
1941	97,274	444,154	4.57	105,108	318,588	3.03
1942	114,079	511,249	4.48	150,402	572,464	3.81
1943	108,916	561,630	5.16	119,764	488,665	4.08
1944	112,565	584,400	5.19	186,434	761,745	4.09

	Utah			Total		
		Value at mines			Value at mines	
Year	Long tons	Total	Average	Long tons	Total	Average
1940	...	...	...	163,327	$ 626,442	$3.84
1941	1,340	$8,535	$6.37	203,722	771,277	3.79
1942	1,184	7,410	6.26	265,665	1,091,123	4.11
1943	...	...	...	228,680	1,050,295	4.59
1944	...	...	...	298,999	1,346,145	4.50

P_2O_5 content was 32.16 per cent. Three mining companies operated in the State in 1944. The Montana Phosphate Products Co., of Trail, British Columbia—the largest producer in 1944 in the Western States—operated its Anderson, Graveley, and Anaconda mines, and also its leases (Great Falls 076740, 081920, 077348, and 076890) in Powell County, Mont. Most of the mined product was exported to the Consolidated Mining and Smelting Co. at Trail, but a considerable quantity was sold in the United States. The International Minerals and Chemical Corporation, which in 1942 acquired the Federal lease of the Northwestern Improvement Co. (St. Paul, Minn.), in the Douglas Creek area, Granite County, Mont., carried on considerable development at the mine in 1944. It mined a few thousand tons of phosphate rock and treated it in a large test mill recently erected at Sherryl, on the Philipsburg branch of the Northern Pacific Railway about 7 miles from the mine, producing a considerable tonnage of higher grade concentrates. However, no sales or shipments of the material were made in 1944. Lee H. Skeels, trustee for Soluble Phosphates, Ltd., Maxville, Granite County, Mont., mined a small tonnage at the mine near Maxville in 1944 but made no shipments during the year.

No phosphate rock was produced in Utah in 1944 The Garfield Chemical and Manufac-

Potato Scab Reduced by Fertilizers

The percentage of scabby potatoes haf consistently been reduced as the amounts o commercial fertilizers have been increased in a three years test conducted by the Agricultural Experiment Station at Cornell University. Rye cover crops have had little influence on scab in this series of tests, but applications of stable manure have given slight increases, the Station reports.

The percentage of tubers showing sclerotia of Rhizoctonia has been reduced by the use of commercial fertilizers and by the use of manure and rye cover crop. Increased yields were also obtained by the use of the materials.

BUYERS' GUIDE • A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

This list contains representative concerns in the Commercial Fertilizer Industry, including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.
For Alphabetical List of Advertisers, see page 33.

AMMONIA—Anhydrous and Liquor
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.
Nitrogen Products, Inc., New York City

AMMONIUM NITRATE SOLUTIONS
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

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Mente & Co., Inc., New Orleans, La.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Mente & Co., Inc., New Orleans, La.

BAG MANUFACTURERS—Paper
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Fulton Bag & Cotton Mills, Atlanta, Ga.
Hammond Bag & Paper Co., Welisburg, W. Va.
Jaite Company, The, Jaite, Ohio
Raymond Bag Co., Middletown, Ohio.
St. Regis Paper Co., New York City.

BAGS—Dealers and Brokers
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Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
St. Regis Paper Co., New York City.

BAGGING MACHINES—For Filling Sacks
St. Regis Paper Co., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Utility Works, The, East Point, Ga.

BONE BLACK
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
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BONE PRODUCTS
American Agricultural Chemical Co., New York City.
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Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.
Dickerson Co., The, Philadelphia, Pa.
Hollingshurst & Co., Inc., New York City
Huber & Company, New York City.
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.

BUCKETS—Elevator
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BUCKETS—For Hoists, Cranes, etc.
Hayward Company, The, New York City.

CARBONATE OF AMMONIA
American Agricultural Chemical Co., New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.

CARS AND CARTS
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

CHEMICALS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
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Bradley & Baker, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Products, Inc., New York City
Phosphate Mining Co., The, New York City.

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Shuey & Company, Inc., Savannah, Ga.
Stillwell & Gladding, New York City.
Wiley & Company, Baltimore, Md.

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Keim, Samuel D., Philadelphia, Pa.
Phosphate Mining Co., The, New York City.

COPPER SULPHATE
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Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.

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American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, New York City.

DRYERS
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Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

FERTILIZER MANUFACTURERS
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American Cyanamid Company, New York City.
Armour Fertilizer Works, Atlanta, Ga.
International Minerals and Chemical Corporation, Chicago, Ill.
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

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HOPPERS
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

IMPORTERS, EXPORTERS
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American Limestone Co., Knoxville, Tenn.
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Bradley & Baker, New York City.
McIver & Son, Alex. M., Charleston, S. C.

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MACHINERY—Acid Making and Handling
Chemical Construction Corp., New York City.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying
Hough Co., The Frank G., Libertyville, Ill.
Hayward Company, The, New York City.
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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Grinding and Pulverizing
Bradley Pulverizing Co., Allentown, Pa.
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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

MACHINERY—Material Handling
Hayward Company, The, New York City.
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Utility Works, The, East Point, Ga.

MACHINERY—Power Transmission
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Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Superphosphate Manufacturing
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

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McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corporation, Atlanta, Ga.

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American Agricultural Chemical Co., New York City.
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Ashcraft-Wilkinson Co., Atlanta, Ga.
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
Chilean Nitrate Sales Corp., New York City.

NITRATE OF SODA—Continued
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
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Schmaltz, Jos. H., Chicago, Ill.

NITROGEN SOLUTIONS
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American Agricultural Chemical Co., New York City.
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McIver & Son, Alex. M., Charleston, S. C.
Phosphate Mining Co., The, New York City.
Ruhm, H. D., Mount Pleasant, Tenn.
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Southern Phosphate Corp., Baltimore, Md.

PLANT CONSTRUCTION—Fertilizer and Acid
Chemical Construction Corp., New York City.
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International Minerals & Chemical Corporation, Chicago, Ill.
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United States Potash Co., New York City.

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Schmaltz, Jos. H., Chicago, Ill.
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Armour Fertilizer Works, Atlanta, Ga.
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U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

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American Agricultural Chemical Co., New York City.
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Bradley & Baker, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
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